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SERVER APPARATUS, SUBSCRIBER
APPARATUS AND INFORMATION ON
DEMAND SYSTEM

Ins. A' → BACKGROUND OF THE INVENTION

(1) Field of the Invention

The present invention relates to an information on demand system which provides information to subscribers through a CATV network and process improvement of a system in which subscribers pay charge to a server according to provided amount of information. Accordingly, in an information on demand system in accordance with the present invention, a plurality of different charging system are provided for every form which a subscriber utilizes the information.

(2) Description of the Prior Art

In an information on demand system such as CATV, an information provider (server) and users (subscribers) make contract each other. CATV cables are provided between the server and the subscribers and an information such as an audio/video signal is provided from the server to the subscribers. In this case, there is basically only one charging system and the charging system is that the server periodically collects the same amount of charge even if the subscriber records an audio/video information provided by the server in a video tape recorder (VTR, hereafter) or the like that at the subscriber (receiver) side or the subscriber merely listens/watches the same information by a television receiver without recording it in a VTR.

In the above-mentioned charging system, however, different charging systems can be set for the same CATV line.

Especially, since audio/video information becomes to be transmitted by a digital signal, if the audio/video information which is composed of a digital signal is recorded in a recording medium such as a digital video tape recorder (VTR), a copy which has no deterioration in audio/video quality compared with an audio/video information provided by the server can be obtained at the subscriber side. This is a problem from a view point of copyright protection.

SUMMARY OF THE INVENTION

An information on demand system in accordance with the present invention aims at making subscribers of CATV terminals pay adequate charge to a CATV server. It makes possible to control a recording/reproducing apparatus (usually called merely a recorder) and to record a received information in a recording medium. Using an information on demand system in accordance with the present invention, the subscribers can pay adequate charge to the server according to the purpose for which the subscribers use the received information.

To solve the above-mentioned problem, an information on demand system in accordance with the present invention includes an information providing apparatus for providing an audio/video information according to a subscriber's request; a display terminal for displaying the audio/video information provided by the information providing apparatus; and a recording/reproducing apparatus for recording the audio/video information provided by the information providing apparatus; and is composed so that a different amount is charged to the subscriber among the case in which only the information is displayed on a display terminal, the case in which the information is recorded in a recording/reproducing apparatus and the case in which not only the information is displayed on a display terminal but also the information is recorded in a recording/reproducing apparatus.

10 BRIEF DESCRIPTION OF THE DRAWINGS

15 **FIG. 2** is a block diagram of a display terminal used in an information on demand system in accordance with the first exemplary embodiment of the present invention.

FIG. 4 is a block diagram of a subscriber apparatus used in an information on demand system in accordance with a fourth exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

(First Exemplary Embodiment)

The right side of FIG. 1 shows a block diagram of a subscriber apparatus at a receiver side of the system. Block 6 is a provided information designating apparatus for reporting the information which the subscriber requests to the

server. Block 7 is an information receiving apparatus for receiving the information which is provided from the server according to a subscriber's request. Block 8 is a subscriber's mode discriminating apparatus for discriminating which the output signal of information receiving apparatus 7 is provided to the subscriber's display terminal or to the subscriber's recording/reproducing apparatus and reports the subscriber's ID number to the server through line 11. Block 9 is a recording/reproducing apparatus for recording the provided audio/video information outputted from subscriber's mode discriminating apparatus 8. Although an optical disc is used as a recording/reproducing medium in the exemplary embodiment, any medium which can record and reproduce such as magnetic recording medium and semiconductor device may be used. Block 10 is a display terminal for outputting the audio/video information provided by subscriber's mode discriminating apparatus 8 as a sound and picture. Although a cathode ray tube (CRT, hereafter) is used as a picture display device in the exemplary embodiment, all devices which transmits information to a subscriber through subscriber's five senses, such as a liquid crystal display device, picture forming apparatus displaying information on a copyable medium like paper such as a printer can be used. The block 11 is a wired CATV line and anything which can transmit information such as wired lines like a telephone line and wireless means like satellite communication may be used.

The performance of an information on demand system composed as the above is explained below. In the exemplary embodiment, a CATV cable is used for line 11.

A subscriber designates an audio/video information which the subscriber wants to be provided through provided information designating apparatus 6. Provided information designating apparatus 6 transmits a subscriber's ID number and an ID number of a designated audio/video information to a server side through line 11. When the server apparatus receives the subscriber's ID number and the ID number of a requested audio/video information, subscriber identification apparatus 1 identifies the subscriber's ID number, judges whether the subscriber's ID number is registered. If the ID number is registered in the server side, the server outputs a signal to allow to provide the audio/video information to information providing apparatus 2 and if the ID number is not registered, the server outputs a signal to prohibit from providing the audio/video information to information providing apparatus 2.

Information providing apparatus 2 which was allowed to provide the audio/video information transmits the audio/video information which the subscriber had requested to information receiving apparatus 7 through line 11. Information receiving apparatus 7 demodulates (decodes) the received audio/video information. In the case in which the information signal is transmitted with a scrambled procedure, the signal is provided to subscriber's mode discriminating apparatus 8 after descrambling procedure. Subscriber's mode discriminating apparatus 8 outputs the audio/video information either to display terminal 10 such as a CRT or to recording/reproducing apparatus 9 according to the subscriber's request. At the same time, the subscriber's information is transmitted to subscriber's mode recognizing apparatus 3 at the server side through line 11.

Subscriber's mode recognizing apparatus 3 which received an information from the subscriber outputs the information to charging apparatus 4. Charging apparatus 4 is set so that the charging amount is larger when the audio/video information is provided to the subscriber's recording/reproducing apparatus 9 than when provided to the subscrib-

In the case of an audio/video information such as movies because it is necessary to record an audio/video information for several hours by a digital signal, an optical disk is used as recording/reproducing apparatus 9 in the exemplary embodiment.

15 An information on demand system in accordance with a second exemplary embodiment of the present invention is explained below referring to FIGS. 1 and 2. The blocks having similar functions to those in the first exemplary
20 embodiment are numbered with the same reference numbers.

40 The performance of the information on demand system is similar to that of the first exemplary embodiment. Because the information in semiconductor memory 23 of display terminal 10 is erased after a designated time, when the information is provided to display terminal 10, the subscriber can enjoy a game for the designated time.

(Third Exemplary Embodiment)

Block 12 is a user's drive operating state logging apparatus for collecting information concerning to a user's drive operating state and has a configuration to collect each subscriber's charge and to write the charge information for every subscriber.

Charging apparatus 4 and charge registering apparatus 5 are included in the subscriber apparatus. Charging apparatus 4 charges a different amount between the case in which an audio/video information is provided to display terminal 10 and the case in which the audio/video information is pro-

vided to recording/reproducing apparatus 9 according to the output of subscriber's mode discriminating apparatus 8. Charge registering apparatus 5 accumulates the charging amount according to the output of charging apparatus 4.

The subscriber designates the title name of the program 5 which the subscriber requests through provided information designating apparatus 6. Provided information designating apparatus 6 transmits the requested title name and the ID number to the server side through line 11. When the server side receives the requested title name and the ID number, the 10 server outputs a signal to allow to provide the audio/video information to information providing apparatus 2.

Then, information providing apparatus 2 transmits the audio/video information which the subscriber requested to be provided to information receiving apparatus 7 through 15 line 11. Information receiving apparatus 7 outputs a signal to subscriber's mode discriminating apparatus 8 outputs the signal to either display terminal 10 or recording/reproducing apparatus 9 according to the subscriber's request. At the same time, subscriber's mode discriminating apparatus 8 20 outputs a signal specifying which the audio/video information is supplied to display terminal 10 or to recording/reproducing apparatus 9 to charging apparatus 4. Charging apparatus 4 outputs a charge information from subscriber's mode discriminating apparatus 8 to charge registering apparatus 5. Charge registering apparatus 5 accumulates the 25 subscriber's charge amount according to the output signal from charging apparatus 4.

User's drive operating state logging apparatus 12 collects the charge which is asn information concerning to the subscriber's ID number and the user's drive operating state 30 at every month and from every subscriber and writes the charge information for every subscriber. The server can collect the accumulated amount based on the written charge information at every month from every subscriber.

According to the above-mentioned system, a different 35 charging system from a usual charging system can be set when a copy is made without any deterioration in sound/picture quality. Especially, when an analog signal is provided to display terminal 10 and a demodulated and descrambled digital signal is provided in recording/ 40 reproducing apparatus 9 as they are, because an audio/video information having nearly same sound/picture quality as the server's software can be recorded in a recording medium provided in recording/reproducing apparatus 9 at the subscriber side, it is significant to provide multi charging 45 systems.

Because it is not necessary to identify a subscriber's ID number at every time when the audio/video information is 50 provided to the subscriber, the construction at the server side is simple and the time taken for providing information can be shortened.

A similar effect can be obtained by a construction that charge registering apparatus 6 periodically informs the subscriber's charge to the server by that the server periodically 55 visits the subscriber and checks the charge displayed at the subscriber side, even if the system has no user's drive operating state logging apparatus 12 at the server side.

A construction without provided information designating apparatus 6 at the subscriber side can also set a different 60 charging system from usual charging system when a copy without any quality deterioration in sound and picture is made.

(Fourth Exemplary Embodiment)

A block diagram of a subscriber apparatus of an information on demand system in accordance with a fourth 65 exemplary embodiment of the present invention is shown in FIG. 4.

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The output signal of decoder/descrambler 33 is separated 60 into a control data signal at demultiplexer 34 and the separated signals are outputted. The compressed audio signal outputted from output terminal 34b is converted into an original audio signal at audio decompressor 36. the compressed video signal outputted from output terminal 34c 65 is converted into an original video signal at video compressor 35. As a compression method, for example, an MPEG method is used. The control data signal, the compressed

video signal, the compressed audio signal from demultiplexer 34 and the output signal of decoder/descrambler 33 are inputted to terminal controller 39. Both the audio signal at terminal 34b and the video signal at terminal 34c are compressed digital bit-stream signals and they are supplied to recording/reproducing apparatus 41 via terminal controller 39. The audio/video information is recorded in the recording medium by recording (writing) the compressed digital bit-stream at recording/reproducing apparatus 41.

The performance when a provided audio/video information signal is recorded and reproduced at recording/reproducing apparatus 41 is explained below, referring to a flow chart shown in FIG. 5.

Recording/reproducing apparatus 41 is controlled by terminal controller 39. As an interface between recording/reproducing apparatus 41 and terminal controller 39, for example, SCSI-2 (ANSI standard X3. 13-199X) is used.

A recording medium is loaded on recording/reproducing apparatus 41. (action 51 in FIG. 5)

A program which the subscriber wants to record is selected with input key 40 and a write command is given to terminal controller 39. A subscriber's ID number to identify the subscriber and a title name of the program which the subscriber wants to record are written in a recording medium of recording/reproducing apparatus 41. (action 52)

A recording/reproducing apparatus ID number to identify the recording/reproducing apparatus 41, the subscriber's ID number and the title name of the program are checked. (action 53)

When all the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the program are confirmed to be those already registered, recording in the recording medium starts with a following procedure.

When one or more than one of the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the program are confirmed not to be those already registered, terminal controller 39 informs to the subscriber that the recording/reproducing apparatus ID number, the subscriber's ID number or the title name of the program is wrong. (action 54)

Then, terminal controller 39 gives a command to start recording to recording/reproducing apparatus 41. When the program which the subscriber requests is inputted through line 32, recording/reproducing apparatus 41 starts recording. (action 55)

When recording/reproducing apparatus 41 finishes recording, the fact that the recording finished is registered in terminal controller 39. (action 56)

Thus, the CATV server can manage the subscriber's charge, if necessary.

The subscriber apparatus is composed so that both the video signal and the audio signal outputted from video output terminal 37 and audio output terminal 38, respectively, are outputted via terminal controller 39 as a compressed digital bit-stream and whether the ID number is written in the writing medium is checked at starting of recording and when the subscriber's ID number is not written, the audio/video information is not supplied to recording/reproducing apparatus 41. Therefore, unless all the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the recorded program are registered, the subscriber can neither record the audio/video information in recording/reproducing apparatus 41 nor watch the program on the television receiver (display terminal).

Although a subscriber is identified by using a subscriber's ID number in the fourth exemplary embodiment of the present invention, a unique ID number of the recording/reproducing apparatus itself may be used instead of the subscriber's ID number. Similar effect is obtained in an information on demand system that an owner of the write/read device is discriminated from the unique ID number of the recording/reproducing apparatus itself and the charge is collected from the owner of the recording/reproducing apparatus.

The system can be also composed so that the server registers the title name of the program for a particular program and when the subscriber wants to write the title name, the terminal controller can check at the terminal controller if the subscriber is requesting a server's approval.

The charging system can be made so that the information can be reproduced by only a recording/reproducing apparatus which was used to record the audio/video information and by any other reproducing apparatus. In this case, the system is composed so that the descramble apparatus is connected to an arbitrary reproducing apparatus, the descramble apparatus certifies whether the medium in which the information was written has an approved ID number and only when reading from the medium certified by the descramble apparatus, the descramble apparatus performs normally.

According to an information on demand system in accordance with exemplary embodiments of the present invention, when a copy without any deterioration of sound/picture quality is made, a different charging system from usual charge can be set. Especially, when an analog signal is outputted to a recording/reproducing apparatus as they are, an audio/video information having almost same quality as the server's information is recorded in a recording medium of the recording/reproducing apparatus and it is significant to provide with three charging systems.

Because programs and informations are always recorded/written in recording medium based on a subscriber's ID number and a recording/reproducing apparatus ID number, it is possible to restrict a recording/reproducing apparatus used at reproducing.

The invention may be embodied in other specific form without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed:

1. An information on demand system comprising:

a server apparatus for providing information according to a request from a subscriber;

display means for displaying said information provided by said server apparatus; and

recording means for recording said information provided by said server apparatus;

wherein a different amount is charged to said subscriber among a) in the case in which said information is provided to said display means, b) in the case in which said information is provided to said recording means and c) in the case in which said information is provided to said display means and to said recording means.

2. An information on demand system comprising:

information providing means for providing information according to a request from a subscriber;

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